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Amendments to the Specification:

Please replace at page 1 in <u>SUMMARY OF INVENTION</u> all paragraph from 0003 to 0011, with following rewritten text:

(0003)   [[The present invention solves the problem of efficient removal of residual products of combustion from working cylinder of the motor and efficient charge of the cylinder with fresh intake mixture, increases the degree of compression and expansion of the cycle, enhances combustion of mixture and improves quality of exhaust gases, reduces fuel consumption, accomplishes more stable operation of motor and attains higher degree of thermodynamic efficiency coefficient.]]

(0004)   [[The only similar example known to the inventor of this solution is inventors own patent named segmented (internal combustion) motor published 05/20/1996 under number 47919. First shortcoming of that solution (as described in solution to technical problem of named patent 47919), is that inner diameter of motor housing and diameter of the inner-tooth gear should be same. Second shortcoming of above mentioned solution (as stated in description of solution of technical problem and abstract of patent 47919) is that small gear transfers rotary moment to output shafts. Third shortcoming of that solution is insufficiently effective removal of residue of combustion and (because of residue of combustion) ineffective charge of cylinder with fresh intake mixture, or with air in case of diesel version of motor.]]

(0005)   [[Core of this invention is (relative to patent 47919 named segmented internal combustion motor):

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- efficient elimination of all residual products of combustion and corresponding to that achievement of better charge of cylinder with fresh intake mixture, or air in case of diesel motor.
- increased degree of compression (expansion) of work cycle.
- rotary moment is transferred directly from rotor (and not by gears) to output shafts.]]

(0006)   [[Innovation of the invention is introduction of vertical and horizontal off-centering of e/v and e/h, in effect shifting of axis of symmetry of inner-tooth gear relative to rotation axis.]]

(0007)   [[Innovation is rocker which, whether "pushing" or "pulling" rotor, transfers rotary moment to output shafts and defines size of angle of duration of certain strokes of cycle.]]

(0008)   [[Innovation is that output shafts are integral parts of rotor.]]

(0009)   [[Innovation is that relation between diameter of big (inner-tooth gear) and diameter of small (satellite) gear is always 1:2, rather, gear ratio is $i=2$.]]

(0010)   [[Innovation of invention is that diameter of inner-tooth gear does not have to be equal to inner diameter of housing of motor.]]

(0011)   [[Innovation is that, in relation to rotation axis off-center placed needle bearings serve as carriers of satellite gear.]]

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Core of this invention is:

-efficient elimination of all products of combustion from radial placed work cylinder of the motor in the exhaust stroke.

-improved charge of the radial placed work cylinder by fuel-air mixture; fuel-air mixture does not mix with residual products of combustion from the previous cycle.

-different length of piston stroke in individual strokes of the work cycle.

-different angle of rotation for individual strokes of the work cycle therefore it allows different time of duration of individual strokes of the work cycle.

-selection of optimal change of displacement of the work chamber relative to the change of angle of rotation of internal space cylindrical rotor which is exceptionally important during combustion process; it allows necessary time for completion of the process of combustion under optimum condition.

-different compression ratio and expansion ratio of work cycle meaning greater expansion ratio relative to compression ratio making possible extended expansion of products of combustion.

-increase of compression ration or expansion ratio of work cycle.

-improvement of quality of combustion and quality of emission.

-greater thermodynamic coefficient of efficiency of the work cycle of the motor.

- more even operation of the motor.

-reduction of the lateral force pressing piston against wall of the radial placed work
    cylinder.

-reduction of mechanical loses.

-completion of entire work cycle in one rotation of the elliptical rotary motor, which
    means completion of all four stroke in 360 degree of rotation of the main elliptical
    rotary motor shaft.

Please replace at page 2 in BRIEF DSCRIPTION OF THE DRAWINGS all paragraph from 0012
to 0018, with following rewritten text:

(0012)   So that the manner in which the above recited features of the present invention

can be understood in detail, a more particular description of the invention, briefly summarized

above, may be had by referenced to embodiments, some of which are illustrated in the

appended drawings. It is to be noted, however, that the appended drawings illustrate only

typical embodiments of this invention and are therefore not to be considered limiting of its

scope, for the invention may admit to other equally effective embodiments.

(0013)   Figure 1 [[is]] shows a front view cross section of elliptical rotary motor.

(0014)   Figure 2 [[is]] shows a side view cross section of elliptical rotary motor.

(0015)   Figure 3 [[is]] shows principal schematic of action within elliptical rotary motor.

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{0016}   Figure 4 shows change of displacement volume as a function of change of angle

of rotation of internal space cylindrical rotor with elliptic rotary motor (solid line) and with

[[Segmented]] classical motor (dotted line), where Vo is starting displacement, Vg is working

displacement and Vu is total displacement of working radial placed work cylinder, and φ is

angle of rotation of internal space cylindrical rotor.

{0017}   Figure 5 shows change of arm of rotation force as a function of change of angle

of rotation of internal space cylindrical rotor with elliptical rotary motor (solid line) and with

[[Segmented]] classical motor (dotted line), where "L" is length of arm of rotation force and φ is

angle of rotation of internal space cylindrical rotor.

{0018}   Figure 6 shows change of rotary moments as a function of change of angle of

rotation of internal space cylindrical rotor with elliptical rotary motor (solid line) and with

[[Segmented]] classical motor (dotted line), where "M" is rotary moment and φ is angle of

rotation of internal space cylindrical rotor.

Please replace at page 3 in DETAILED DESCRIPTION all paragraph from 0019 to 0027, with
following rewritten text:

{0019}   [[The present invention Figures 1 and 2 show that within stator 1 of the motor

rotates rotor 2 within which is contained working cylinder 3, and within that cylinder 3 is piston 6.

Under the action of force which is created by combustion of fuel piston 6, which is by way of rod

7 connected to larger pin 9, moves towards left inner dead center (IDC).]]

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(0020)   [[Larger pin 9 is connected to rocker 8 which is by way of smaller pin 10 connected to rotor 2 and which transfers rotary moment to rotor 2. Figure 1 shows rotor 2 that rotates counterclockwise and, when in that position where smaller pin 10 is in opening 23, rocker 8 "pulls" rotor 2. When smaller pin 10 moves to opening 25, rocker 8 then shifts its position and it "pushes" rotor 2. Larger pin 9, due to motion of rod 7, also moves satellite gears 12 which carry off-center mounted (relative to rotor axis) roller pin bearings 13, and which are geared to inner-tooth gear 11.]]

(0021)   [[Geared pairs 11 and 12 with ratio 1:2 (i=2) strictly define position of piston 6 relative to two outer dead centers (lower and upper ODC) and 2 inner dead centers (left and right IDC), and due to above-mentioned transfer ratio create elliptical trajectory of a point of action of rotary force.]]

(0022)   [[Rotary moment is, from rotor 2, via shafts 17 and 20, which are integral parts of rotor 2, and which rest on roller bearings 22, hence transferred to outside of motor.]]

(0023)   [[By shifting horizontal axis of gear 11, by the amount of off-centering e/h or namely by half of height between piston 6 (when piston 6 is in upper ODC relative to cylinder 3 in stage of starting displacement), the following is accomplished: at the end of exhaust cycle in lower ODC piston 6 physically completely expels residue of combustion from working cylinder 3, i.e. squeezes out residual gases that have not evacuated working cylinder 3 through exhaust port 16. In further rotation of rotor 2 and motion of piston 6 towards right IDC sub-pressure (almost vacuum) is created, causing intensive intake of working mixture into cylinder 3 through the intake port 15.]]

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(0024) ~~[[Selection of position of ports 23 or 25 in rotor 2 and length of rocker 8, as well as selection of appropriate off-centers e/h and e/v accomplishes desired angles of individual trokes of work cycle. That way it is possible to select optimal angle of duration of expansion stroke with, at the same time, lesser angle of duration of exhaust and compression stroke, but larger angle of duration of intake stroke.]]~~

(0025) ~~[[Seal between rotor 2 and stator 1 is done by seals 5 within the head of work cylinder 4, and cooling of motor is done by liquid coolant through openings 21. On the stator 1 furthermore are openings for regulating vacuum 19 and opening 2 for flushing and cooling 24 of forehead (top) of piston 6. Elliptical rotary motor is on lateral sides closed by deck lids 18 which at the same time serve as carriers of roller bearings 22 and needle bearings 13.]]~~

(0026) ~~[[When elliptical rotary motor is done like four stroke Otto motor, then previously compressed fresh mixture is ignited by a spark from sparkplug located in position 14 and when elliptical rotary motor is done like diesel motor, then fuel is injected into previously compressed air also from position 14.]]~~

(0027) ~~[[While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.]]~~

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Figure 1 and 2 show that in cylindrical ring shaped inner space of housing motor (1) is internal space cylindrical rotor (2), inside it is radial placed work cylinder (3) and in radial placed work cylinder (3) is piston (6). On the upper side of radial placed work cylinder (3), as its extension in its longitudinal axis is located work cylinder cap (4) with opening in the middle. Under the gas force or the force created by combustion of fuel in the work chamber of radial placed work cylinder (3) (that is space between piston (6) dome and inner cylindrical surface of motor housing (1), piston (6), which is via its piston pin connected to the connecting rod (7) and following that via other end of connecting rod (7) connected with connecting axle (9), moves towards left inner dead center (LIDC) with simultaneous rotation of internal space cylindrical rotor (2).

Oscillating lever (8) on one of its ends has shackle whose both openings are connected by connecting axle (9) and via it with end of connecting rod (7) so that inner sides of shackle are located to the left and right of connecting rod (7). On its other end oscillating lever (8) has opening which is via pin (10) connected to the opening (23) which is located in internal space cylindrical rotor (2) (but which instead opening (23) can also be connected with opening (25) which is also located in the internal space cylindrical rotor (2)). That way oscillating lever (8) transfers to the internal space cylindrical rotor (2) gas force created by combustion of fuel in expansion stroke in work chamber of radial placed work cylinder (3). Gas force relative to the center of the internal space cylindrical rotor (2) creates torque which results in rotation of internal space cylindrical rotor (2) around its axis. In the remaining strokes (exhaust, intake, compression) rotation from internal space cylindrical rotor (2) due to momentum, with help of flywheel located outside of elliptical rotary motor, transfers via oscillating lever (8) and connecting axle (9) to the piston (6).

Figure 1 shows counterclockwise rotation of internal space cylindrical rotor (2) and in that case oscillating lever (8) "pulls" internal space cylindrical rotor (2) behind it. When other opening of oscillating lever (8) is switched from opening (23) of internal space cylindrical rotor (2) to opening (25) also located in internal space cylindrical rotor (2) and connected via pin (10) then oscillating lever (8) "pushes" internal space cylindrical rotor (2) in front of it. Selection of one or the other opening (23) or (25) achieves different mode of change of displacement of work chamber of radial placed work cylinder (3) as a function of angle of rotation of internal space cylindrical rotor (2) and with that we achieve different mode of transfer of gas force and also different mode of change of torque of internal space cylindrical rotor (2).

Gear mechanism consists of two satellite gears (12) which, via openings which are displaced from their centers, are mutually parallel connected by connecting axle (9). Satellite gears (12) are geared to two inner tooth gears (11) which are offset by eccentricity e_h and e_v relative to the center of rotation of internal space cylindrical rotor (2) and in a ratio i=2. Depending upon distance between their longitudinal axes and axis of opening in which they are connected to connecting axle (9), directly depends stroke of piston (6) and displacement of work chamber of radial placed work cylinder (3). Satellite gears (12) are positioned relative to each other as in mirror image and are carried by swinging bearing rings (13) via sleeve. Abovementioned swinging bearing rings (13) are via bearings mounted to the hubs of deck-lids (18) and relative to longitudinal axis of deck-lids (18) are offset by the same eccentricities e_h and e_v as inner tooth gears (11). Because of mentioned ratio i=2,every point of satellite gears (12) (except their centers) during their rolling in each work cycle, which lasts 360 degrees, moves along imagined closed elliptic curve. That makes possible for new work cycle again to begin always from the same position of internal space cylindrical rotor (2) relative to motor housing (1) and also that motion along imagined ellipse makes possible to define during each work cycle

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position of piston (6) relative to the two outer dead centers (upper and lower ODC) and two inner dead centers (left and right IDC).

Entire gear mechanism functions as follows:

motion of piston (6) via connecting rod (7) transfers to the connecting axle (9) which is connected to satellite gears (12) causing their rolling along inner tooth gears (11). Simultaneously satellite gears (12) spin around their own axes and because swinging bearing rings (13) carry them via sleeves during their rolling and spinning relative to longitudinal axis of radial placed work cylinder (3) they also make relative oscillating motion as a pendulum. In other words from the vantage point on axes of radial placed work cylinder (3), during rotation of internal space cylindrical rotor (2) satellite gears (12) alternately appear on the left end right side of that axis. The length of that pendulum is defined by normal distance between longitudinal axis of swing rings (13) and axis of sleeve or that length is equal to half diameter of basic circle of satellite gear (12). Amplitude of those oscillations depends on mutual relation between half axes of above mentioned imagined ellipse as well as value of selected eccentricities e_h and e_v. Angle speed of center of satellite gears (12) relative to center of rotation of internal space cylindrical rotor (2) when angle speed of internal space cylindrical rotor (2) is constant, changes during one work cycle. Shape and size of lower part of opening in internal space cylindrical rotor (2) where satellite gears (12) are located depend on amplitude of their oscillation. Torque from internal space cylindrical rotor (2),via shafts (17) and (20), and form integral internal space cylindrical rotor (2), and which rest on bearings (22), transfers outside motor.

Piston (6) has dome whose shape matches inner shape of work cylinder cap (4). When horizontal symmetrical axes of both inner tooth gears (11) move by the same value of eccentricity e_h or by half of height of space between top of dome of piston (6) and inner surface

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of motor housing (1), when piston (6) relative to radial placed work cylinder (3) is in upper outer dead center (UODC) in position of initial displacement of work chamber - then thru opening (16), located in wall of motor housing (1), piston (6) at the end of exhaust stroke expels all residual products of combustion which previously have not left work chamber of radial placed work cylinder (3) (which is schematically shown in picture 3 when piston (6) is in lower outer dead center (LODC). That way in work chamber of radial placed work cylinder (3) there are no residual products of combustion from the cycle which just ended so that in intake stroke which immediately follows, in work displacement of radial placed work cylinder (3) where there is only mixture of fuel-air (or air only in diesel version of elliptical rotary motor).

All four work strokes are completed when internal space cylindrical rotor (2) spins 360 degrees around its longitudinal axis and when piston (6) is located two times in position of two upper dead center and two lower dead centers. Different duration of those work cycles and also mode of change of work displacement of radial placed work cylinder (3) as a function of change of that angle may occur because:

- of selection of different eccentricities e_h and e_v

- of selection of different length of oscillating lever (8) and also by selection of different position of openings (23) or (25) located in internal space cylindrical rotor (2)

- of selection whether the other end of oscillating lever (8) is located in opening (23) of internal space cylindrical rotor (2) or in opening (25) of internal space cylindrical rotor (2).

Selection of either of abovementioned possibilities individually, or all possibilities simultaneously, causes different change of slant of longer axis of mentioned imagined ellipse relative to longitudinal axis of internal space cylindrical rotor (2), or relative to horizontal axis of

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inner tooth gears (11). That way in all strokes of work cycle, optimal mode of change of displacement of work chamber of radial placed work cylinder (3), may be selected relative to change of angle of rotation of internal space cylindrical rotor (2).

Figure 3 shows one of possible selections of different size of angle which occurs between individual strokes of work cycle during rotation of internal space cylindrical rotor (2) of elliptical rotary motor.

Sealing of work chamber of radial placed work cylinder (3) or prevention of leaking of fuel-air mixture or exhaust gases is done by piston rings located in grooves in piston (6) and rings (seals) located in sealant groove (5) in work cylinder cap (4) of radial placed work cylinder (3).

Cooling of elliptic rotary motor is done by coolant circulating thru cooling chambers (21) located in the wall of motor housing (1) and also by oil which is on the inside of motor housing (1) by the action of centrifugal force applied to the moving parts of the elliptical rotary motor.

Connecting of motor housing (1) to inner tooth gears (11) and deck-lids (18) is done by bolts and defining of initial position of motor mechanism and centering of motor housing (1), inner tooth gears (11) and deck-lids (18) is done by centering pin.

Also located in motor housing (1) are opening (19) for regulation sub-pressure and opening (24) for flushing and cooling of the dome of the piston (6).

Elliptical rotary motor is closed on both sides by deck-lids (18) which simultaneously serve as carriers of bearings (22) and swinging bearing rings (13).

Work cycle of elliptical rotary motor begins by moving of piston (6) from LODC towards right inner dead center (RIDC) by the intake stroke in-taking fuel-air mixture (or only air in diesel version of elliptical rotary motor) into work chamber of radial placed work cylinder (3) thru intake port (15) located in the wall of motor housing (1). Intake stroke ends with arrival of piston (6) to the RIDC and continued motion of piston (6) towards UODC begins compression stroke. Ignition of compressed fuel-air mixture (or injection of fuel into compressed air in diesel version) is done by spark of the spark plug (or by injector in diesel version) from spark plug opening (14) of motor housing (1). Moment of ignition (or injection) can happen before piston (6) arrives to UODC, at UODC or after passing of piston (6) thru UODC, depending on selected mode of change of displacement of work chamber of radial placed work cylinder (3) and selected size of angle of rotation of internal space cylindrical rotor (2) in individual strokes of the work cycle. After completed combustion piston (6) due to gas force continues motion towards LIDC when in expansion stroke portion of potential energy of the products of combustion transforms into mechanical work. Expansion stroke ends by arrival of piston (6) to LIDC and immediately after that work chamber of radial placed work cylinder (3) arrives to the exhaust port (16) located in the wall of motor housing (1). Continued motion of piston (6) towards LODC eliminates products of combustion from the work chamber of radial placed work cylinder (3) thru exhaust port (16) simultaneously by outflow due to pressure of the products of combustion in work chamber of radial placed work cylinder (3) and pushing of products of combustion by the dome of piston (6).